

Earthquakes: Why are we having so many earthquakes? Has earthquake activity been increasing? Does this mean a big one is going to hit? OR We haven't had any earthquakes in a long time; does this mean that the pressure is building up and there will be a big one?

Although it may seem that we are having more earthquakes, earthquakes of magnitude 7.0 or greater have remained fairly constant throughout this century and, according to our records, have actually seemed to decrease in recent years.

There are several reasons for the perception that the number of earthquakes, in general, and particularly destructive earthquakes is increasing.

1) A partial explanation may lie in the fact that in recent years, we have definitely had an increase in the number of earthquakes we have been able to locate each year. This is because of the tremendous increase in the number of seismograph stations in the world and the many improvements in global communications.

In 1931, there were about 350 stations operating in the world; today, there are more than 4,000 stations and the data now comes in rapidly from these stations by telex, computer and satellite. This increase in the number of stations and the more timely receipt of data has allowed us and other seismological centers to locate many small earthquakes which were undetected in earlier years, and we are able to locate earthquakes more rapidly.

The NEIC now locates about 12,000 to 14,000 earthquakes each year or approximately 50 per day. Also, because of the improvements in communications and the increased interest in natural disasters, the public now learns about more earthquakes. According to long-term records (since about 1900), we expect about 18 major earthquakes (7.0 - 7.9) and one great earthquake (8.0 or above) in any given year. However, let's take a look at what has happened in the past 32 years, from 1969 through 2001, so far. Our records show that 1992, and 1995-1997 were the only years that we have reached or exceeded the long-term average number of major earthquakes since 1971. In 1970 and in 1971 we had 20 and 19 major earthquakes, respectively, but in other years the total was in many cases well below the 18 per year which we may expect based on the long-term average.

2) The population at risk is increasing. While the number of large earthquakes is fairly constant, population density in earthquake-prone areas is constantly increasing. In some countries, the new construction that comes with population growth has better earthquake resistance; but in many it does not. So we are now seeing increasing casualties from the same sized earthquakes.

3) Better global communication. Just a few decades ago, if several hundred people were killed by an earthquake in Indonesia or eastern China, for example, the media in the rest of the world would not know about it until several days, to weeks, later, long after such an event would be deemed "newsworthy." So by the time this information was available, it would probably be relegated to the back pages of the newspaper, if at all. And the public Internet didn't even exist. We are now getting this

Earthquakes: Why are we having so many earthquakes? Has earthquake activity been increasing? Does this mean a big one is going to hit? OR We haven't had any earthquakes in a long time; does this mean that the pressure is building up and there will be a big one?

information almost immediately.

4) Earthquake clustering and human psychology. While the average number of large earthquakes per year is fairly constant, earthquakes occur in clusters. This is predicted by various statistical models, and does not imply that earthquakes that are distant in location, but close in time, are causally related. But when such clusters occur, especially when they are widely reported in the media, they are noticed. However, during the equally anomalous periods during which no destructive earthquakes occur, no one deems this as remarkable.

A temporal increase in earthquake activity does not mean that a large earthquake is about to happen. Similarly, quiescence, or the lack of seismicity, does not mean a large earthquake is going to happen. A temporary increase or decrease in the seismicity rate is usually just part of the natural variation in the seismicity. There is no way for us to know whether or not this time it will lead to a larger earthquake. Swarms of small events, especially in geothermal areas, are common, and moderate-large magnitude earthquakes will typically have an aftershock sequence that follows. All that is normal and expected earthquake activity.

See [NEIC's Earthquake Statistics](#) webpage for the tables of earthquake counts by magnitude and year.

Last update: 08-29-2011 14:31